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DVM-58D DIGITAL VOICE MODULE OPERATIONS MANUAL

The DVM-58D Digital Voice Module (DVM) is a board-level unit which is especially suited for the recording and reproduction of verbal messages. It is as easy to operate as a tape recorder and has competitive audio quality, yet it will never wear or distort like a tape can.

The DVM-58D has been re-designed with minor enhancements made to its function, such as the addition of a 44K bps sampling rate setting and the ability to use either a 1Mb x 1 or 4Mb x 1 DRAM's. Otherwise the DVM-58D remains completely compatible including wiring pin-outs and the same product reliability as previous versions.

Features

- Low standby current .
- Adaptive Delta Modulation (ADM).
- No rewind hassles.
- Selectable 16K/32K/44K bps sampling rate.
- Play up to16 individual messages w/ variable partitioning lengths.
- End of speech (EOS) signal.
- Instant recording and playback.
- 0.5W audio amplifier on board with volume control.
- 12 pin and 18 pin wire harnesses are included.
- Jumpers to selections: REPEAT mode:
  VOX (voice activated switch).
  AUTO-RESET (w/ single message).
  ENDLESS loop recording.

Specifications

- One 1 Mb DRAM on board with three vacant sockets for optional DRAM expansion.
- Additional 1x1 Mb or 4x1 Mb DRAMs sold separately. (NOTE: 1x1 Mb DRAM and 4x1 Mb DRAM cannot be used on the unit concurrently.)
- Should power be interrupted, an optional 0.1F/5.5V capacitor can be purchased separately to backup the DRAM memory. (With 4Mb's of DRAM installed and in stand-by mode, back up time would be approximately 45 seconds .)

0. BEFORE YOU GET STARTED

0.1 Throught this manual, when a reference is made to positions on the board, it is assumed that the board orientation is being held with the18-pin connector (J2) to the RIGHT, and the 12-pin connector (J1) is at the bottom.

0.2 All of the logic inputs and outputs are TTL level signals (GND=LOW and +5= HIGH).

1. SETUP- MEMORY INSTALLATION

1.1 Installation of the DRAM memory IC's.

1.1.1 The DRAM IC's are inserted into the four sockets on the left-side of the board starting with U1, then U2, U3 and U4 as needed. Be sure to align the notch on the IC with the notch on the socket.

1.1.2 Set jumper J15 for the DRAM type being used on the board, DOWN= 1Mb x 1, UP= 4Mb x 1.

1.1.3 Set jumpers JP1 and JP2 to accomodate the number of actual IC's installed in sockets U1-U4. These jumpers are located just to the right of the 12-pin harness connector (J1).

IC INSTALLED JUMPER POSITION

Socket#	JP1	JP2
U1	Down	Down
U2	Up	Down
U3	Down	Up
U4	Up	Up

1.2 Preset the sampling rate jumpers.

1.2.1 Setting both jumpers JP3 and J16 in combination will acheive the desired sampling rate required, 16K, 32K or 44K bps. The faster the sampling rate, the better the audio quality becomes, but it requires more DRAM.

SAMPLING	JUMPER POSITION	
bps	JP3	J16
16K	Down	Right
32K	Up	Right
44K	UP	Left

DRAM vs. MESSAGE TIME

Mb's	16K bps	32K bps	50K bps
1	1:04 min.	0:32 min.	0:20 min.
2	2:08 min.	1:04 min.	0:41 min.
3	3:16 min.	1:36 min.	1:02 min.
4	4:20 min.	2:08 min.	1:23 min.
8	8:40 min.	4:16 min.	2:46 min.
12	13:00 min.	6:30 min.	4:11 min.
16	17:20 min.	8:42 min.	5:35 min.

2. WIRING

2.1 The DVM-58D can be wired in any one of the three following configurations.

2.1.1 *Single Message Control*: Use this configuration if you only need to record, store and playback one message on a single channel.

2.1.2 *Direct Message Triggering*: Use this configuration if you require multiple messages which you will be controlling the record and playback manually from external switches or contacts.

2.1.3 *Binary Message Coding*: Use this configuration if you require multiple messages and they will be controlled from an external circuit or micro-controller.

2.2 General wiring notes:

2.2.1 No matter which configuration you select, you must follow the general guidelines listed below.

2.2.2 Connect a 12VDC power supply only to the +12V and GND inputs on the 12-pin wire harness.

WARNING: Never connect +12V to any other point on the DVM-58D other than the main power supply input or damage will occure to your board. To trigger messages, use only the +5V supply.

2.2.3 A regulated +5V supply is available at the +5V pin on the 12-pin harness. This supply is used to drive the DVM-58D's logic inputs and message triggers, as well as having and additional 25mA available for driving your own circuits.

WARNING: A load of more than 25mA on the +5V supply pin may damage the DVM-58D.

2.2.4 A 9V battery may be attached as a short-term memory back-up when loss of the normal power supply occures. Back-flow protection is handled by an onboard diode. For longer periods of back-up, we recommend the use of a larger, sealed lead-acid battery with a trickle charger circuit.

2.2.5 The DVM-58D is designed for use with a low-impedance microphone or attenuated audio loaded from an equalized audio source for best results. (see 7.3)

2.2.6 All message inputs except RESET, have internal pull-down resistors so that when these inputs are not connected, they are LOW. The RESET input has a pull-up resistor onboard.

2.3 Single Message Control:

2.3.1 Wire the DVM-58D according to FIG. 2, but leave the 4-pin jumpers **installed** on block (JP7).

2.3.2 An external RESET button is not required as long as the RESET jumper (JP4) is moved to the ON position (Up).

2.4 Direct Message Triggering:

2.4.1 Wire the DVM-58D according to FIG.1

2.4.2 The 18-pin connector is used to control the message channels which are on pins 1 through 16. Pin 17 is marked as STROBE and connects to the common of the RECORD/PLAY mode switch. Pin 18 is currently unused.

2.4.3 Make sure that the jumpers in block JP7 (PHRASE 1) are in place and connecting the opposing pins.

2.4.4 Set the RESET jumper (JP4) to the OFF (Down) position.

2.5 Binary Message Coding:

2.5.1 Wire the DVM-58D according to FIG. 2

2.5.2 Set the RESET jumper (JP4) to the OFF (Down) position.

2.5.3 Remove the four jumpers on block JP7 (PHRASE 1) and use the top row of pins as the connection for the 4-bit message inputs. DO NOT connect anything to the bottom row of 4-pins, as this may damage the board.

2.5.4 The pin to the LEFT is the LEAST-SIGNIFICANT BIT (BIT0), and the pin on the RIGHT is the MOST-SIGNIFICANT BIT (BIT3). The message channels are selected by standard binary coding as follows. Each pin is ON when connected to +5V and is OFF when connected to GND or left open.

BINARY MESSAGE CODES

Message Channel	BIT3	BIT2	BIT1	BIT0
1	OFF	OFF	OFF	OFF
2	OFF	OFF	OFF	ON
3	OFF	OFF	ON	OFF
4	OFF	OFF	ON	ON
5	OFF	ON	OFF	OFF
6	OFF	ON	OFF	ON
7	OFF	ON	ON	OFF
8	OFF	ON	ON	ON
9	ON	OFF	OFF	OFF
10	ON	OFF	OFF	ON
11	ON	OFF	ON	OFF
12	ON	OFF	ON	ON
13	ON	ON	OFF	OFF
14	ON	ON	OFF	ON
15	ON	ON	ON	OFF
16	ON	ON	ON	ON

3. SINGLE MESSAGE OPERATION

3.1 Recording Message

3.1.1 Turn your RECORD switch to the ON position, the unit will remain in the RECORD mode until the switch is turned OFF. The LED will become lit to indicate recording in progress.

3.1.2 Speak clearly into your microphone.

3.1.3 After recording is completed, turn your RECORD switch to the OFF position, the LED will also turn off.

NOTE: If you record to the end of your installed memory, recording will automatically stop with the LED turning off.

3.2 Playback Message

3.2.1 To playback a message, press your momentary PLAY switch to hear the entire message.

3.2.2 You may stop the message at anytime during playback by simply pressing the PLAY button a second time.

3.2.3 The component VR1 is the volume control, adjust as required.

3.3 Re-recording-

3.3.1 To record over a previously recorded message, just follow the same steps as in section 3.1

4. MUTIPLE MESSAGE OPERATION

Whether you are using Direct Message Triggering or Binary Message Coding, the same recording sequence must be followed to record multiple messages. The sequence is out lined below. The exact method for recording or playback varies slightly depending on which technique you use.

Note: Both the RESET jumper and the REPEAT jumper must be in the OFF position for proper recording. After the recording is finished, the REPEAT jumper may be turned on for playback, if desired (only for Binary Message Coding). Always press your RESET button before recording the first message.

4.1 Recording Messages (Direct Trigger)

4.2 ALWAYS record messages in order (#1,#2,#3, ect).

4.3 Put the RECORD/PLAY switch into RECORD position.

4.4 Press and hold the message select button for the message that you wish to record. Recording will begin and the LED will light.

4.5 Speak into the microphone to record your message.

4.6 When you are finished recording, release the button to terminate the recording.

NOTE: If you record to the end of memory, recording will automatically stop and LED will go out. You must still turn the RECORD switch to PLAY before proceeding.

4.7 Play back the message to verify that it is correct. Component VR1 on the board is the volume control, adjust it as necessary.

4.8 If the message is as you like it, continue to the 5.1

4.9 If the message did not turn out right, re-record the message as follows:

4.9.1 If you are re-recording message #1, Press the RESET button, then re-record it again as usual. If re-recording message #2 or higher see next step.

4.9.2 Play back the message that comes immediately before the one you need to re-do. Let the message continue to the end. *For example, if you just recorded message 3 and you do not like the way that sounds, then play back message 2, when it ends then you are ready to re-record message 3 once again.*

4.9.4. Re-record the message again as usual.

5. Playback Message(s) (Direct Trigger)

5.1 Put the RECORD/PLAY switch into the PLAY position.

5.2 Press a message select button to initiate playback. The LED will light during playback and the message will auto matically continue until the end.

5.3 The playback may be stopped at any time by pressing the message select button a second time

6. Record Message(s) (Binary Message Coding)

6.1 Recording

6.1.1 Select the desired message number to record at the 4-pin binary input (Refer to section 2.4).

6.1.2 Turn RECORD switch to ON position to start recording, the LED will light indicating recording is in progress.

6.1.3 Speak into the microphone. Follow good recording techniques.

6.1.4 When you are finished recording, turn the RECORD switch OFFposition. The LED will go out.

NOTE: If you record to the end of memory, the recording will automatically stop and LED will go out. You must still turn the RECORD switch to the OFF position.

6.2 Playback Message(s) (Binary Message Coding)

6.2.1 Select the desired message number to playback using the 4-bit binary input (See section 2,4).

6.2.2 Press the Play button to start playback. The LED will light during playback and the message will continue to its end.

6.2.3 The message may be stopped at any time by pressing the PLAY button a second time.

7. GENERAL RECORDING NOTES

7.1 Always speak loudly and clearly. Do not hold the micro phone too close or too far from your mouth.

7.2 Try recording at different volumes and distances from the microphone to determine which combination of volume and distance results in the best recordings.

7.3 Although you can record directly into the DVM-58 using a microphone, the best recordings by far can be created by using an audio amplifier system. This will also allow you to use a cassette tape player as well as any other sound equipment such as equalizers, mixers, and reverb boxes to greatly enhance the quality of your recordings. This method also offers you a backup of the message(s) on a cassette tape.

7.2.1 The output of an amplifier must be attenuated to a reduced signal level before it goes into the DVM-58 microphone input. Attenuating cables are readily available at sound equipment and electronics parts stores for only a few dollars. An attenuator that we recommend is the RADIO SHACK Dubbing Cord, part number 42-2152.

8. OTHER CONFIGURATION OPTIONS.

8.1 **REPEAT(JP9)**: This jumper selects the automatic repeat ing mode. When in the repeating mode, the unit retriggers the message at the end of each playback. To stop the repeating message, simply trigger playback a second time.

8.2 **ENDLESS(JP6)**: Turns the ENDLESS recording mode ON and OFF. When this jumper is On, only a single message is used and recording continues for as long as the RECORD switch is ON. When recording is stopped, the last 30 seconds to 8 minutes of speech in memory will playback (playback time depends on the sampling rate configuration and DRAM's installed). Pressing PLAY will playback the entire message (in memory) and then stop. When using ENDLESS recording, Single Message Control must be used, but the RESET jumper must be placed in the OFF position.

8.3 **VOX(JP5)**: Turns the Voice Activated Switch (VOX) ON/OFF. When On, recording does not start and LED does not light until you begin speaking. Sometimes, the VOX may not capture the first syllable of the message, or it may not trigger with weak signal inputs. If this is the case, it may be disabled with the jumper in the OFF position.

8.4 External volume control.

8.4.1 Remove the three jumpers from the jumper block called VOLUME (JP8).

8.4.2 Connect a 20K Ohm potentiometer (variable resistor) to the LOWER three pins of the jumper. The CENTER pin connect the the WIPER ARM of the potentiometer.

NOTE: The potentiometer is connected to the amplifier section of the board, so, to avoid noise, keep the wires as short as possible and use shielded cable if possible.

8.5 Obtaining an End-Of-Speech signal (EOS).

8.5.1 Disconnect the LED from the EOS/LED pin. The EOS signal isn't usuable with LED in place.

8.5.2 Send the signal to your circuit. The EOS signal is HIGH during recordings or playback. It is LOW at all other times.

8.5.3. If you still wish to have an LED indication while using EOS signal, then buffer the EOS signal and send the buffered signal to the LED in series with a 600 Ohm resistor.

8.6 Installing a backup Capacitor.

8.6.1 You may solder a 0.1 Farad capacitor at location C24 on the board. A larger value capacitor can be used if the pin spacing is the same. The larger trace on the left is the negative pad with the pad on the right being the positive.

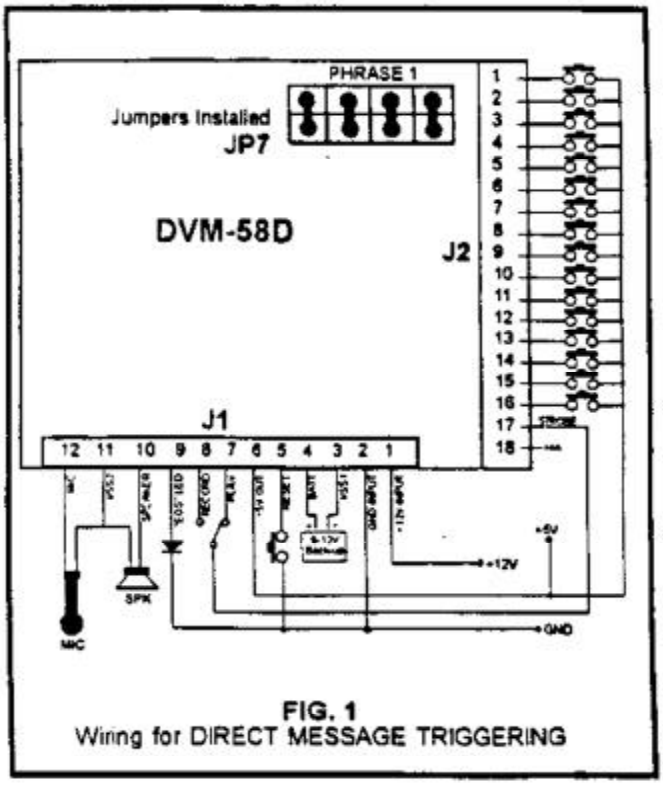

FIG. 1
Wiring for DIRECT MESSAGE TRIGGERING

FOR TECHNICAL SUPPORT CALL: 818-912-9864

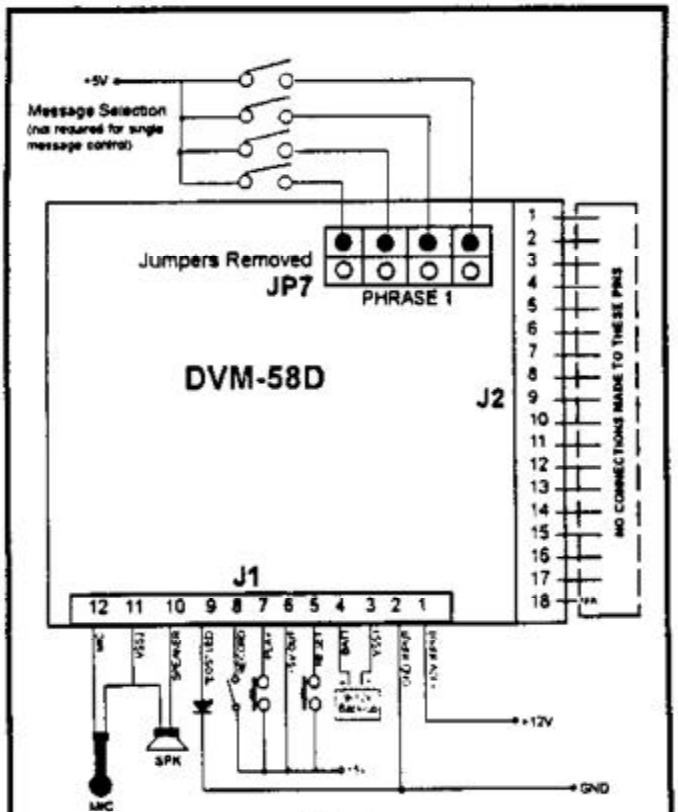

FIG. 2
Wiring for SINGLE MESSAGE CONTROL
or BINARY MESSAGE CODING

SPECIFICATIONS

ELECTRICAL	
Power Supply:	6-12 VDC, 200 mA
Specs. for Current based on 4 Mb's of DRAM	
Stand-by Current:	8mA
Playback Current:	17 to 130 mA
PHYSICAL	
Length:	5-3/4" *(5" to Detach Line)*
Width:	2-3/4"
Height:	1/2"
ENVIRONMENTAL	
Operating Temperature:	10°C to 50°C
Storage Temperature:	-20°C to 80°C
OTHER	
Microphone Input:	Low-impedance Dynamic
Speaker Output:	4-8 Ohms, 1/2 watt
DRAM Memory:	1 Mb x 1, DIP (4 pcs. max.) or 4 Mb x 1, DIP (4 pcs. max.)

LIMITED WARRANTY

The DVM-58D is warranted against manufacturing defects in material and workmanship for six (6) months from the date of purchase. Within this period, MING will, at its option, repair or replace the product or any part thereof without charge for parts and labor. To exercise the warranty, the product and the original purchase invoice must be returned to MING, freight prepaid and insured.

This warranty does not apply in the following cases: improper installation, misuse, failure to follow installation and operating instructions, alteration, abuse, accident or tampering.

MING is not responsible or liable for indirect, special, or consequential damages arising out of or in connection with the use or performance of the product or other damages with respect to any economic loss, loss of property, loss of revenues or profit or costs of removal, installation or reinstallation.

Except as provided herein, MING makes no express warranties, and any implied warranty of merchantability or fitness for a particular purpose is limited in its duration to the duration of the written limited warranties set forth herein.

There will be charges rendered for repairs to the product made after the expiration of the aforesaid six months warranty period.

This warranty gives you specific legal rights and you may have other rights which vary from state to state.